EXHIBIT O-12

SMaRt Station ®

Operated by GreenTeam/Zanker

Weekly Interior Sweeping — Week Ending 1/27/04

AREA — Supervisor: Darin — Day Completed

Tipping Floor	Freq	M	T	W	Th	F
Area around roll-offs near concrete bunker	Daily	✓	✓	✓	✓	✓
Area around HazMat shed and roll-offs	Daily	✓	✓	✓	✓	✓
Backside near diesel pump	Daily	✓	✓	✓	✓	✓
Refrigerator recovery area	Daily	✓	✓	✓	✓	✓
Prohibited waste pallets emptied	Daily	✓	✓	✓	✓	✓

Transfer Area/Shop	Freq	M	T	W	Th	F
Floors behind push walls	Daily	✓	✓	✓	✓	✓
Driveway to top loader	Daily	✓	✓	✓	✓	✓
Inspect and clean AMFAB	Daily	✓	✓	✓	✓	✓
Tops of push walls	Weekly	✓		✓		✓
Eyewash stations (2nd weekend of month)	Monthly					

Pit Cleaning	Date	% LEL % O2	Date	% LEL % O2	Date	% LEL % O2	Date	% LEL % O2
Compactor Conveyor	1-23							
Top Loader Conveyor								
Wood Room Conveyor	1-23		1-24		1-25		1-26	
Residential Feed Conveyor	1-25							
Commercial Feed Conveyor	1-26							

Floor Clear (Daily) and Clean (Weekly)	Date	West Clear Time	West Clean Time	MRF Mgr. Initial	East Clear Time	East Clean Time	OPS Mgr. Initial
Comments	1-23		8:12	✓		3:00	✓
	1-24		8:09	✓		3:00	✓
	1-25		8:00	✓		3:00	✓
	1-26		8:05	✓		3:00	✓
	1-27		8:00	✓		3:00	✓

Weekly Storm Drain Maintenance Log

AREA — Supervisor: Darin — Day Completed

Storm Drains	Frequency	M	T	W	Th	F
Check for Oil/Fuel Spills	Daily	✓	✓	✓	✓	✓
Rock Bag Present	Daily	/	/	/	/	/
Make sure Dock Gutters are Clear of Debris	Daily					
H2S Smell	When Raining	✓	✓	✓	✓	✓
Water Flow	When Raining	✓	✓	✓	✓	✓
Clean Grades & Remove Debris	When Needed, Prior to Rain	/	/	/	/	/
Make sure Filter is Clean	When Rain Expected	/	/	/	/	/
Is Outside of Tip Floor Area Clean?	When Rain Expected	✓	✓	✓	✓	✓

Comments:

O-13

Uptime Report **Date;** 11/05

		Tip Floor			MRF			Total SMaRT		
Date	Day	Available Hours	Operating Hours	Downtime	Available Hours	Operating Hours	Downtime	Available Hours	Operating Hours	Downtime
11/1	Tues	12	12		16.5	16.5		28.5	28.5	0
11/2	Wed	12	12		16.5	16.5		28.5	28.5	0
11/3	Thurs	12	12		16.5	14.5	2	28.5	26.5	2
11/4	Fri	12	12		16.5	16.5		28.5	28.5	0
11/5	Sat	9	9					9	9	0
11/6	Sun	9	9					9	9	0
11/7	Mon	12	12		16.5	16.5		28.5	28.5	0
11/8	Tues	12	12		16.5	16.5		28.5	28.5	0
11/9	Wed	12	12		16.5	16.5		28.5	28.5	0
11/10	Thurs	12	12		16.5	16.5		28.5	28.5	0
11/11	Fri	12	12		16.5	16.5		28.5	28.5	0
11/12	Sat	9	9					9	9	0
11/13	Sun	9	9					9	9	0
11/14	Mon	12	12		16.5	16.5		28.5	28.5	0
11/15	Tues	12	12		16.5	14.5	2	28.5	26.5	2
11/16	Wed	12	12		16.5	16.5		28.5	28.5	0
11/17	Thurs	12	12		16.5	16.5		28.5	28.5	0
11/18	Fri	12	12		16.5	16.5		28.5	28.5	0
11/19	Sat	9	9					9	9	0
11/20	Sun	9	9					9	9	0
11/21	Mon	12	12		16.5	16.5		28.5	28.5	0
11/22	Tues	12	12		16.5	16.5		28.5	28.5	0
11/23	Wed	12	12		16.5	16.5		28.5	28.5	0
11/24	Thurs	12	12		16.5	16.5		28.5	28.5	0
11/25	Fri	12	12		16.5	15.5	1	28.5	27.5	1
11/26	Sat	9	9					9	9	0
11/27	Sun	9	9					9	9	0
1/28	Mon	12	12		16.5	16.5		28.5	28.5	0
1/29	Tues	12	12		16.5	16.5		28.5	28.5	0
11/30	Wed	12	12		16.5	16.5		28.5	28.5	0
		336	336	0	363	358	5	699	694	5
	% Downtime			0.0			1.4			0.7

% UPTIME

694/699 = 99.2%

EXHIBIT O - 14

Minimum Software Capabilities Per Section 3.13

The software features shall include the following minimum capabilities:

1. Operating:
   a. Microsoft Windows XP Professional (or greater) compatible, 32 bit compliant.
   b. Utilize Oracle 9 (or greater), Microsoft XQL Server 2003 (or later) or Microsoft Access 2003 (or later) as its' relational database.
   c. Fully network enabled, allowing concurrent access to the same database for all connected PC workstations.
   d. Have multiple password-protected operator classes to allow for effective segregation of duties of system users.
   e. Have appropriate data entry controls to ensure that appropriate data is entered into each field (e.g., look-up tables, logical controls, etc.)
   f. Capable of integrating and interfacing to up to four scales.
   g. Capable of controlling peripheral equipment such as gates, lights, and bar code or radio frequency readers.
   h. Interface and integrate with cash drawer(s) that will be connected to each PC workstation in the scale house.
   i. Include on-line help.
   j. Capable of tracking loads by multiple waste and payment types.
   k. Capable of maintaining and accessing customer lists by customer or vehicle number.
   l. Capable of adding new customers, vehicles, and materials in real-time.
   m. Allows a vehicle to haul for single or multiple customers.
   n. Capable of handling cash transactions, with appropriate cash controls.
   o. Calculates invoice based on user-defined units (pounds, tons, kilograms, cubic yards, load, count, gallons, barrels, containers, bushels, etc.)

2. Ticketing
   a. Capable of initiating transactions based on vehicle number or license number.
   b. Able to apply both table driven and variable (override) price formulation and multiple taxes to loads.
   c. Capable of performing automatic yardage to tonnage conversion when scale is inoperable.
   d. Numerically controlled receipt for each customer showing gross, tare, and net weight and total disposal charge.

e. Capable of producing detailed ticket within seconds of scale stabilization.
f. Capable of adding notes to tickets.
g. Provides user selected special tickets including random inspection, no weigh, manual weights, and fixed charges.
h. Allows ticket editing for authorized operators.

3. Reporting
   a. Include flexible report writer software (Crystal Reports is desirable) that allows user customization of reports and scale tickets.
   b. Provide for cash drawer balancing, reporting, and reconciliation.
   c. Use Microsoft 2003 for standard word processing and Microsoft Excel 2003 for standard spreadsheet processing.
   d. Standard reports include:
      1) Customer Information Listing
      2) Vehicle Information Listing
      3) Material Information Listing
      4) Job Information Listing
      5) Transaction Listing by Date Range
      6) Cash Transactions by Date Range
      7) Charge Transactions by Date Range
      8) Transactions Sorted and Subtotaled by Customer, by Date Range (detailed and summary)
      9) Transactions Sorted and Subtotaled by Vehicle, by Date Range (detailed and summary)
      10) Transactions Sorted and Subtotaled by Material, by Date Range (detailed and summary)
      11) Transactions Sorted and Subtotaled by City, by Date Range (detailed and summary)
      12) Random Inspection Report, by Date Range
      13) Traffic Report - Number of Vehicles in and out, Ability to sort by hour.

4. Invoicing
   a. Create ready-to-mail invoices for all transaction types.
   b. Operator selection of desired time period.
   c. Reprints single invoice or any selected range of invoices.
   d. Provide a fixed length daily output file for interface with other computers or software packages (e.g. Microsoft Access 2003, Microsoft Excel 2003, Oracle, DIF, etc.)

EXHIBIT P

Recycling Level and Allocation of Revenues from Sale of Recycled Materials

Contractor's Revenue Share	City's Revenue Share	Recycling Level Achieved
75.0%	25.0%	25.0-25+%
69.0%	31.0%	24.5-24.9%
63.0%	37.0%	24.0-24.4%
57.0%	43.0%	23.5-23.9%
52.0%	48.0%	23.0-23.4%
47.0%	53.0%	22.5-22.9%
42.0%	58.0%	22.0-22.4%
38.0%	62.0%	21.5-21.9%
34.0%	66.0%	21.0-21.4%
30.0%	70.0%	20.5-20.9%
26.0%	74.0%	20.0-20.4%
22.0%	78.0%	19.5-19.9%
18.0%	82.0%	19.0-19.4%
15.0%	85.0%	18.5-18.9%
12.0%	88.0%	18.0-18.4%
9.0%	91.0%	17.5-17.9%
6.0%	94.0%	17.0-17.4%
3.0%	97.0%	16.5-16.9%
0.0%	100.0%	Below 16.5%

EXHIBIT Q

FAITHFUL PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS,
THAT _____
hereinafter called the PRINCIPAL, and

_____,
a corporation duly organized under the laws of the State of _____,
having its principal place of business at _____,
in the State of _____, and authorized to do business as an admitted surety insurer in the State of California, regulated by the California Insurance Commissioner and with a financial condition and record of service satisfactory to the City of Sunnyvale, hereinafter called the SURETY, are held and firmly bound to the City of Sunnyvale, a municipal corporation in the State of California, hereinafter called the OBLIGEE, in the sum of Two Million Dollars ($2,000,000) lawful money of the United States, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the PRINCIPAL has entered into a Contract with the OBLIGEE for the operation of the Sunnyvale Materials Recovery and Transfer Station ("Contract") and said PRINCIPAL is required under the terms of said Contract to furnish a bond of faithful performance of said Contract.

NOW, THEREFORE, if the PRINCIPAL shall well and truly perform and fulfill all of the undertakings, covenants, terms and agreements of said Contract, and any modification thereto made as therein provided, at the time and in the manner therein specified, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

The SURETY, for value received, hereby agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or the specifications incorporated therein shall impair or affect its obligations on this bond, and it hereby waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED, however, that the SURETY shall not be liable (1) as respects to any obligations related to said Contract occurring after two (2) years from the date of this Bond, unless this Bond is extended, or (2) with respect to PRINCIPAL'S obligation to procure a replacement performance bond, as provided for in Section 7.03 of the Contract. This Bond may be extended beyond _____, 2009 in the sole discretion of the SURETY by means of a continuation certificate in form and substance satisfactory to OBLIGEE signed at least ninety (90) days prior to _____, 2009.

EXHIBIT Q

In the event suit is brought upon this Bond by the OBLIGEE and the OBLIGEE is the prevailing party, the SURETY shall pay, in addition to the sums set forth above, all costs incurred by the OBLIGEE in such suit, including reasonable attorneys' fees to be fixed by the court.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument as of this ____ day of _____, 2007.

_____
(PRINCIPAL)

By: _____
Name: _____
Title: _____

_____
(SURETY)

By: _____
Attorney-In-Fact

Name: _____

* * *

Note: To be considered complete, both the principal and surety must sign this performance bond. In addition, the surety's signature must be acknowledged by a notary public and a copy of the surety's power of attorney must be attached.

EXHIBIT Q-1

CONTINUATION CERTIFICATION

In consideration of the premium charged,

_____ hereby continues in force:

Bond #: _____

Dated: _____

In the amount of: Two Million Dollars ($2,000,000)

on behalf of the City of Sunnyvale, for the period:

Beginning: _____

And Ending: _____ subject to all terms and conditions of said Bond, PROVIDED that the liability of :_____
(NAME OF SURETY)
shall not exceed in the aggregate the amount above written, whether the loss shall have occurred during the term of said bond or during any continuation or continuations thereof, or partly during said term and partly during any continuation or continuations thereof.

Signed and Sealed: _____ (date)

By: _____
Attorney-In-Fact

[ACKNOWLEDGEMENT]

EXHIBIT R

ARBITRATION OF DISPUTES ARISING UNDER SECTIONS 3.04 OR 10.20

1. Demand for Arbitration

If Contractor is dissatisfied with a decision of the City under Section 3.04 or Section 10.20, it shall serve a Demand for Arbitration on the City within sixty (60) days of that decision. The Demand for Arbitration shall describe the issues to be arbitrated and Contractor's contentions relating to those issues. The Demand shall be served on the City Manager with a copy delivered to the City Attorney.

2. Number and Qualifications of Arbitrators

The arbitration shall be conducted by a panel of three (3) arbitrators. One arbitrator shall be appointed by Contractor, one arbitrator shall be appointed by the City, and the third arbitrator shall be appointed by the other two arbitrators. The third arbitrator of the arbitration panel shall be an attorney licensed to practice within the courts of the State of California and shall be the "neutral arbitrator" referred to in California Code of Civil Procedure Section 1280(d). No member of the panel shall be an officer, employee, agent, or attorney of Contractor or the City, or an affiliate of Contractor. Alternatively, the parties may agree on a single arbitrator, in which case that arbitrator shall be the "neutral arbitrator".

3. Appointment

Within thirty (30) days after a Demand for Arbitration has been served, each party shall personally serve the other with notice of the names of the arbitrators they have selected.

The two arbitrators named by the parties shall select the third arbitrator within thirty (30) days. If they are unable to agree upon a third arbitrator, either party may request the Presiding Judge of the Superior Court in Santa Clara County to make the appointment.

4. Powers of Arbitrators; Conduct of Proceedings

(a) Except as hereinafter provided, arbitrations shall be conducted under and be governed by the provisions of California Code of Civil Procedure, Sections 1282.2 through 1284.2 (hereinafter, collectively, "Code sections"), and arbitrators appointed hereunder shall have the powers and duties specified by the Code sections.

(b) Unless waived in writing by the parties, the notice of hearing served by the neutral arbitrator shall not be less than 90 days.

(c) The lists of witnesses (including expert witnesses), and the lists of documents (including the reports of expert witnesses) referred to in Code of Civil Procedure Section 1282.2 shall be mutually exchanged, without necessity of demand therefor, no later than sixty (60) days prior to the date of the hearing, unless otherwise agreed in writing by the parties.

(d) The time for making the award shall be no later than twelve (12) months after service of the initial Demand for Arbitration, provided that such time may be waived or extended as provided in Code of Civil Procedure Section 1283.8.

(e) The arbitrators shall not base their award on information not obtained at the hearing.

(f) The provisions for discovery set forth in Code of Civil Procedure Section 1283.05 are incorporated into and made part of this contract, except that (1) leave of the arbitration panel need not be obtained for the taking of depositions, including the depositions of expert witnesses; (2) the provisions of Code of Civil Procedure Section 2037 *et seq.*, relating to discovery of expert witnesses, shall also be applicable to arbitration proceedings arising under this contract, except that the time period set forth in Section 2037(a) shall be deemed to be not later than sixty (60) days prior to the date for the hearing; and (3) all reports, documents, and other materials prepared or reviewed by any expert designated to testify at the arbitration shall be discoverable.

(g) The arbitration award shall be in writing and determined by a majority of the members of the arbitration panel.

(h) The arbitration panel jurisdiction and authority are limited to a determination of the Minimum Recycling Level (in the case of a dispute arising under Section 3.04) or the amount of compensation due to Contractor under this contract (in the case of a dispute arising under Section 10.20). The arbitration panel is not authorized, and does not have jurisdiction, to determine or award money damages against City, its officers, employees or agents.

5. Costs.

Each party shall pay the compensation and expense of the arbitrator which it appoints, as well as its own costs and attorneys' fees, expert and witness fees, and other expenses incurred in preparing and presenting its case. The compensation and expenses of the neutral arbitrator, rental of the hearing room, costs of a stenographic reporter, and other costs of the arbitration shall be divided equally between and paid equally by Contractor and City.

Exhibit S
Method for Calculating Recycling Percentage

The recycling level achieved by the Contractor will be calculated as shown below:

A = Tons of Municipal Solid Waste coming into the SMaRT Station for the month. (*Note: Municipal Solid Waste does not include source separated yard trimmings, source separated curbside and public haul materials and materials delivered to the Buyback/Drop off Center. - See definition of Municipal Solid Waste in Exhibit A.)

B = Tons of Municipal Solid Waste placed in transfer trucks and hauled to the Kirby Canyon Landfill for disposal during the month.

C = Percent of incoming Municipal Solid Waste recovered during the month.

$$A-B/A = C$$

The following example shows how this formula will be used to calculate the recycling level achieved:

A = 200,000 tons
B = 145,000 tons

200,000 tons – 145,000 tons / 200,000 tons = 27.5% Recycled

Exhibit T

Protocols for Waste Characterization Studies

1. Scope

1.1 The method describes the procedures for measuring the composition of unprocessed municipal solid waste (MSW) by employing manual sorting. The procedure applies to the determination of the mean composition of MSW based on the collection and manual sorting of a number of samples of waste over a selected period of time with a minimum of one week.

1.2 The procedures include those for collection of a representative sorting sample of unprocessed waste, manual sorting of the waste into individual waste components, data reduction, and reporting of results.

1.3 The method may be applied at landfill sites, waste processing and conversion facilities, and transfer stations.

2. Definitions

2.1 Sorting Sample: A 200 to 300 lb portion that is deemed to represent the characteristics of a vehicle load of MSW.

2.2 Unprocessed Municipal Solid Waste: Solid Waste in its discarded form, i.e., waste that has not been size reduced or otherwise processed.

2.3 Waste Component: A category of solid waste composed of materials of similar physical properties and chemical composition, which is used to define the composition of solid waste, e.g.., ferrous, glass, newsprint, yard waste, aluminum, etc.

2.4 Solid Waste Composition or Waste Composition: The characterization of solid waste as represented by a breakdown of the mixture into specified waste components on the basis of mass fraction or of weight percentage.

2.5 Composite Item: An object in the waste that is composed of multiple waste components or dissimilar materials, such as disposable diapers, bi-metal beverage containers, electrical conductor composed of metallic wire encased in plastic insulation, etc.

3. Summary of Methods

3.1 The number of samples to be sorted is calculated based upon statistical criteria selected by the investigators.

3.2 Vehicle loads of waste are designated for sampling, and a sorting sample is collected from the discharged vehicle load.

3.3 The sorting sample is manually sorted into waste components. The weight fraction of each component in the sorting sample is calculated from the weights of the components.

3.4 The mean waste composition is calculated using the results of the composition of each of the sorting samples.

4. Significance and Use

4.1 Waste composition information has wide application and can be used for such activities as solid waste planning, designing waste management facilities, and establishing a reference waste composition for use as a baseline standard in facility contracts and in acceptance test plans.

4.2 The method can be used to define and report the composition of municipal solid waste through the selection and manual sorting samples of waste. Care should be taken to consider the source and seasonal variation of waste, where applicable.

4.3 After performing a waste composition analysis, laboratory analysis may be performed on representative samples of waste components or mixtures of waste components for purposes related to the planning, management, design, testing, and operation of resource recovery facilities.

5. Apparatus

5.1 Sufficient metal, plastic, or fiber containers for storing and weighing each waste component, labeled accordingly. For components that will have a substantial moisture content (e.g., food waste), metal or plastic containers are recommended to avoid absorption of moisture by the container and, thus, the need for a substantial number of weighings to maintain an accurate tare weight for the container.

5.2 A mechanical or electronic weigh scale with a capacity of at least 200 lb, and a precision of at least 0.1 lb.

5.3 Heavy-duty tarps, shovels, rakes, push brooms, dust pans, hand brooms, magnets, sorting table, first aid kit, miscellaneous small tools, traffic cones, traffic vests, leather gloves, hardhats, safety glasses, and leather boots.

6. Precautions

6.1 Review the precautions and procedures with the operating and sorting personnel prior to the conduct of the field activities.

6.2 Sharp objects such as nails, razor blades, hypodermic needles, and pieces of glass are present in solid waste. Personnel should be instructed of this danger and brush waste particles aside while sorting, as opposed to projecting their hands with force into the mixture. Personnel handling and sorting solid waste should wear appropriate protection. Appropriate protection includes heavy leather gloves, hardhats, safety glasses, and safety boots.

6.3 During the process of unloading waste from collection vehicles and of handling waste with heavy equipment, projectiles may issue from the mass of waste. The projectiles can include flying glass particles from breaking glass containers and metal lids from plastic and metal containers that burst under pressure when run over by heavy equipment. The problem is particularly severe when the waste handling surface is of high compressive strength, e.g., concrete. Personnel should be made aware of the danger and wear eye and head protection if in the vicinity of the collection vehicle unloading point, or in the vicinity of heavy equipment, or both.

6.4 Select a location for discharge of designated loads, manual sorting activities, and weighing operation that is flat, level, and away from the normal waste handling and processing areas.

6.5 Weigh storage containers each day, or more frequently if necessary, in order to maintain an accounting of the tare weight.

7. Calibration

7.1 All weigh scale equipment shall be calibrated according to the manufacturer's instructions. Take appropriate corrective action if the readings are different than the calibration weights.

8. Procedures

8.1 Secure a flat and level area for discharge of the vehicle load. The surface should be swept clean or covered with a clean, durable tarp prior to discharge of the load.

8.2 Position the scale on a clan, flat, and level surface and adjust the level of the scale if necessary. Check the accuracy and operation of the scale with a known (i.e., reference) weight.

8.3 Weigh all empty storage containers and record the tare weights.

8.4 Determine the number of sorting samples to be sorted. The determination is a function of the waste components to be sorted and the desired precision as applied to each component. Weights of 200 to 300 lb for sorting samples of unprocessed solid waste are recommended. The number of samples is determined using the calculation method described in section 9.1.

8.5 A comprehensive list of waste components for sorting is shown in Table A. A description of some of the waste component categories is given in Table B. Other waste components can be defined and sorted depending upon the purpose of the waste composition determination. The list in Table A is comprised of those components most commonly used to define and report the composition of solid waste. At a minimum, it is recommended that the complement of left-justified categories in Table A be sorted. Therefore, similar breakdowns of solid waste composition are available for purposes of comparison, if desired. Label the storage containers accordingly.

TABLE A. List of Waste Component Categories

Mixed Paper	Other Organics
High Grade Paper	Ferrous
Computer Printout	Cans
Other Office Paper	Other Ferrous
Newsprint	Aluminum
Corrugated	Cans
Plastic	Foil
PET Bottles	Other Aluminum
HDPE Bottles	Glass
Film	Clear
Other Plastic	Brown
Yard Waste	Green
Food Waste	Other Organics
Wood	

TABLE B. Description of Some Waste Component Categories

Category	Description
Mixed Paper	Office paper, computer paper, magazines, glossy paper, waxed paper, other paper not fitting categories of "Newsprint" and "Corrugated
Newsprint	Newspaper
Corrugated	Corrugated medium, corrugated boxes or cartons, brown (kraft) paper (i.e., corrugated) bags
Plastic	All plastics
Yard Waste	Branches, twigs, leaves, grass, other plant material
Food Waste	All food waste except bones
Wood	Lumber, wood products, pallets, furniture
Other Organics/ Combustibles	Textiles, rubber, leather, other primarily burnable materials not included in the above component categories
Ferrous	Iron, steel, tin cans, bi-metal cans
Aluminum	Aluminum, aluminum cans, aluminum foil
Glass	All glass
Other organics/ Non-combustibles	Rock, sand, dirt, ceramics, plaster, non-ferrous non-aluminum metals (copper, brass, etc.), bones

8.6 Vehicles for sampling shall be selected at random during each day of the one-week sampling period, or so as to be representative of the waste stream as agreed to by the affected parties. With respect to random selection of vehicles, any method is acceptable that does not introduce a bias selection. An acceptable method is use of a random number generator. For a weekly sampling period of k days, the number of vehicles sampled each day shall be approximately n/k, where n is the total number of vehicle loads to be selected for determination of waste composition. A weekly period is defined to be 5 to 7 days.

8.7 Direct the designated vehicle containing the load of waste to the area secured for discharge of the load and collection of the sorting sample.

8.8 Direct the vehicle operator to discharge the load onto the clean surface in one contiguous pile, i.e., to avoid gaps in the discharged load. Collect any required information from the vehicle operator prior to the vehicle leaving the discharge area.

8.9 Using mechanical equipment, remove material longitudinally along one entire side of the discharged load, sufficient to form a mass of material which, on a visual basis, is at least four times the desired weight of the sorting sample (i.e., about 1, 000 lb). Mix, cone and quarter this method of selection or a sequence agreed to by all affected parties, for the purpose of eliminating or minimizing biasing of the sample. If an oversize item (e.g., water heater) composes a large weight percentage of the sorting sample, add a notation on the data sheet and weigh it, if possible.

8.10 One sorting sample is selected from each collection vehicle load that is designated for sampling. All handling and manipulation of the discharged load, longitudinal sample, and sorting sample shall be conducted on previously cleaned surfaces. If necessary, remove the sorting sample to a secured manual sorting area. The sorting sample may be placed on a clean table for sorting for the convenience of the sorting personnel. The sorting area shall be a previously cleaned, flat, and level surface.

8.11 Position the storage containers around the sorting sample. From the sorting sample, empty all containers such as capped jars, paper bags, and plastic bags of their contents. Segregate each waste item and place it in the appropriate storage container.

8.12 In the case of composite items found in the waste, separate the individual materials where practical and place the individual materials into the appropriate storage containers. Where impractical, segregate and classify the composite item according to the following order:

8.12.1 If there are many identical composite items (e.g., plastic-sheathed aluminum electrical conductor), place them into the waste component containers corresponding to the materials present in the item and in the approximate proportions according to the estimated mass fraction of each material in the item.

8.12.2 If there are only a few of the identical composite item, place them in the storage container corresponding to the material which comprises, on a weight basis, the majority of the item (e.g., place bi-metal beverage cans in the ferrous container).

8.12.3 If composite items represent substantial weight percentages of the sorting sample, a separate category should be established, e.g., composite roofing shingles.

8.12.4 If none of the above procedures is appropriate, place the item(s) (or proportion it (them)) in the storage container labeled "Other Non-Combustible" or "Other Combustible" as appropriate.

8.13 Sorting continues until the maximum particle size of the remaining waste particles is approximately 0.5 in. At this point, apportion the remaining particles into the storage containers corresponding to the waste components represented in the remaining mixture. The apportionment shall be accomplished by making a visual estimate of the mass fraction of waste components represented in the remaining mixture.

8.14 Record the gross weights of the storage containers and of any waste items sorted but not stored in containers. The data sheet shown in Fig. 1 can be used to record gross weights as well as tare weights.

8.15 After recording the gross weights, empty the storage containers and weigh them again, if appropriate. Re-weighing is important and necessary if the containers become moisture-laden, e.g., from wet waste.

8.16 Clean the sorting site as well as the load discharge area of all waste materials.

9. Calculations

9.1 Number of 200 to 300 lb samples.

9.1.1 The number of sorting samples (i.e., vehicle loads) (n) required to achieve a desired level of measurement precision is a function of the component(s) under consideration, and the confidence level. The governing equation for n is:

$$n - (t^* \, s/e\,\bar{x})^2 \qquad \text{(I)}$$

where t^* is the student t statistic corresponding to the desired level of confidence, s is the estimated standard deviation, e is the desired level of precision, and $\bar{x}$ is the estimated mean.

All numerical values for the symbols are in decimal notation. For example, a value of precision (e) of 20% is represented as 0.2.

One sorting sample is chosen per vehicle load.

Figure 1, Waste Composition Data Sheet

Day/Date _____ Collection Company _____
Site _____ Vehicle Type _____
Weather _____ Route Number _____
Recorded By _____

Component	Weight in Pounds			Percent of Total
	Gross	Tare	Net	
Mixed Paper				
High Grade Paper				
Computer Printout				
Other Office Paper				
Newsprint				
Corrugated				
Plastic				
PET Bottles				
HDPE Bottles				
Film				
Other Plastic				
Food Waste				
Wood				
Other Organics				
Ferrous				
Cans				
Other Ferrous				
Aluminum				
Cans				
Foil				
Other Aluminum				
Glass				
Clear				
Brown				
Green				
Other Inorganics				

Totals _____

Notes _____

_____

_____

Lab Sample Taken? Yes___ No ___

Suggested values of s and of $\bar{x}$ for waste components are listed in Table C. Values of t* are given in Table D for 90% and 95% levels of confidence, respectively.

9.1.2 Estimate the number of samples (n′) for the selected conditions (i.e., precision and level of confidence) and components using equation 1. For the purpose of estimation, select from Table D the t* value for n - - for the selected level of confidence. Since the required number of samples will vary among the components for a given set of conditions, a compromise will be required in terms of selecting a sample size, i.e., the number of samples that will be sorted. The component that is chosen to govern the precision of the composition measurement (and therefore the number of samples required for sorting) is termed the "governing component" for the purpose of this method.

9.1.3 After determining the governing component and its corresponding number of samples (n_o), return to Table D and select the student t statistic (t^*_o) corresponding to n_o. Recalculate the number of samples, i.e., n′ using t^*_o.

9.1.4 Compare n_o to the new estimate of n, i.e., n′, which was calculated for the governing component. If the values differ by more than 10%, repeat the calculations of 9.1.2 and 9.1.3.

9.1.5 If the values are within 10%, select the larger value as the number of samples to be sorted. Refer to Appendix A for a sample calculation of n.

9.2 Component Composition

9.2.1 The component composition of solid waste is reported on the basis of the mass fraction (expressed as a decimal) or percentage of waste component *i* in the solid waste mixture. The reporting is on the basis of wet weight, i.e., the weight of materials immediately after sorting.

9.2.2 The mass fraction of component *i*, mf_i, is defined and computed as:

$$mf_i = \frac{w_i}{\sum_{i=1}^{j} w_i} \qquad (2)$$

where w_i is the weight of component *i* and j is the number of waste components. In those cases where a container is used to store and weigh the materials:

$$w_i = \text{gross weight - tare weight of container} \qquad (3)$$

TABLE C. Values of Mean ($\bar{x}$) and of Standard Deviation (s) for Within Week Sampling to Determine MSW Component Composition[A]

Component	Standard Deviation (s)	Mean ($\bar{x}$)
Mixed Paper	0.05	0.22
Newsprint	0.07	0.10
Corrugated	0.06	0.14
Plastic	0.03	0.09
Yard Waste	0.14	0.04
Food Waste	0.03	0.10
Wood	0.06	0.06
Other Organics	0.06	0.05
Ferrous	0.03	0.05
Aluminum	0.004	0.01
Glass	0.05	0.08
Other Inorganics	0.03	0.06
		1.00

A) The tabulated mean values and standard deviations are estimates based on field test Data reported for municipal solid waste sampled during weekly sampling periods at several locations around the U.S.

TABLE D. Values of t Statistics (t*) as a Function of Number of Samples and Confidence Interval

No. of Samples (n)	90%	95%
2	6.314	12.706
3	2.920	4.303
4	2.353	3.182
5	2.132	2.776
6	2.015	2.571
7	1.943	2.447
8	1.895	2.365
9	1.860	2.306
10	1.833	2.252
11	1.812	2.228
12	1.796	2.201
13	1.782	2.179
14	1.771	2.160
15	1.761	2.145
16	1.753	2.131
17	1.746	2.120
18	1.740	2.110
19	1.734	2.101
20	1.729	2.093
21	1.725	2.086
22	1.721	2.080
23	1.717	2.074
24	1.714	2.069
25	1.711	2.064
26	1.708	2.060
27	1.706	2.056
28	1.703	2.052
29	1.701	2.048
30	1.699	2.045
31	1.697	2.042
36	1.690	2.030
41	1.684	2.021
46	1.679	2.014
51	1.676	2.009
61	1.671	2.000
71	1.667	1.994
81	1.664	1.990
91	1.662	1.987
101	1.660	1.984
121	1.658	1.980
141	1.656	1.977
161	1.654	1.975
189	1.653	1.973
201	1.553	1.972
–	1.645	1.960

APPENDIX A. ESTIMATE OF NUMBER OF SAMPLES FOR ANALYSIS

ASSUMPTIONS

1. Corrugated is selected as the governing component
2. A 90% confidence level is selected
3. A precision of 10% is desired

Therefore:

$s = 0.06$ (from Table C)
$\bar{x} = 0.14$ (from Table C)
$e = 0.10$
t^* (n - -) = 1.545 (from Table D)

Using equation 1:

$$n = [t^* \; s/(e\,\bar{x})]^2$$

$$= \left[\frac{1.645\ (0.06)}{0.1\ (0.14)}\right]^2$$

$= 50$
$= n_o$

Referring again to Table D, for n = 50

$t^{*}90$ (n = 50) = 1.677

and,

$$n = \left[\frac{1.677\ (0.06)}{0.1\ (0.14)}\right]^2$$

$= 52$
$= n'$

Since 52 (i.e., n′) is within 10% of 50 (i.e., n_o), 52 samples should be selected for analysis.

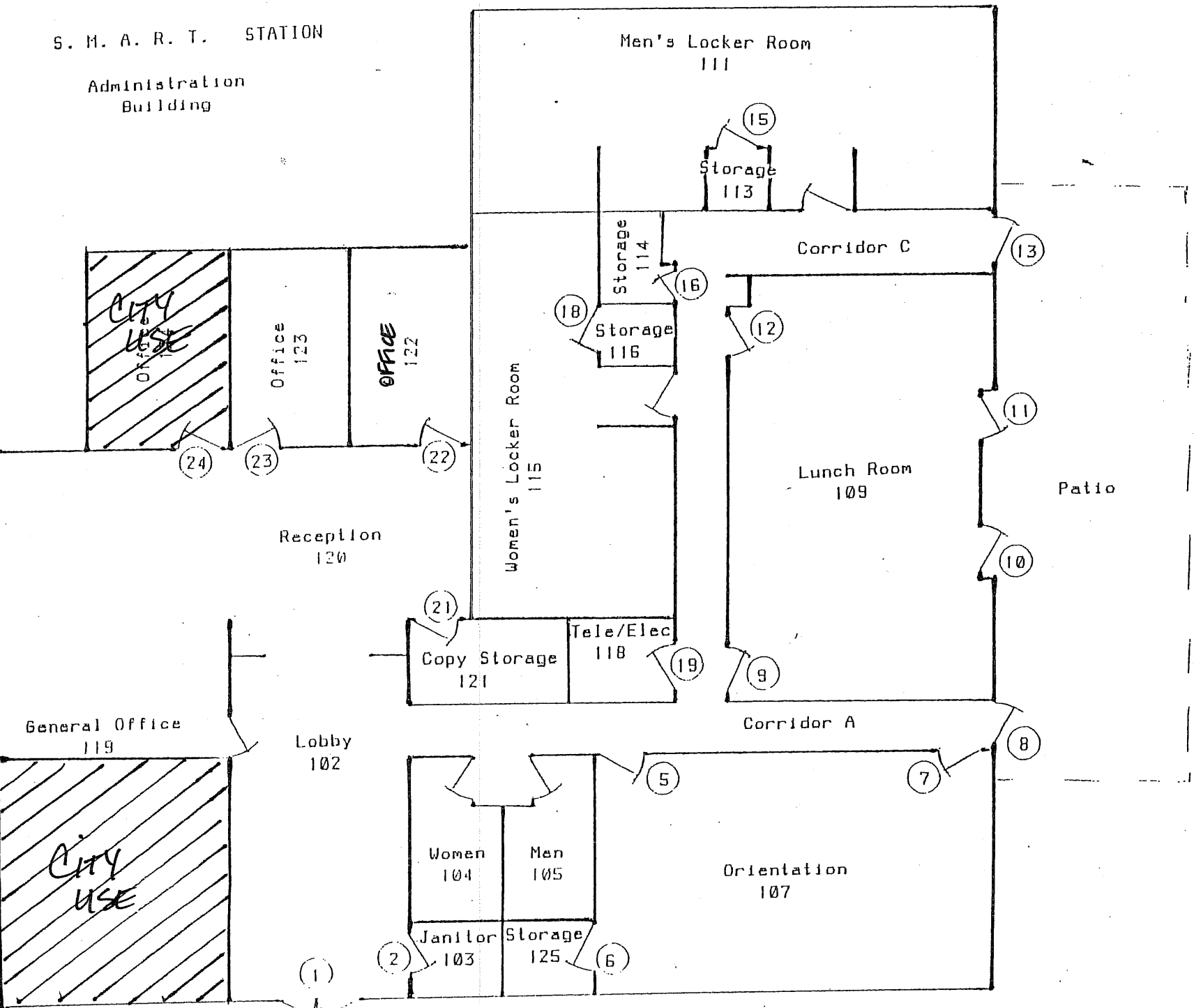
S. M. A. R. T. STATION
Administration Building
Men's Locker Room 111
Storage 113
Storage 114
Corridor C
Storage 116
Women's Locker Room 115
Office 123
Office 122
CITY USE
Lunch Room 109
Patio
Reception 120
Copy Storage 121
Tele/Elec 118
Corridor A
General Office 119
Lobby 102
CITY USE
Women 104
Men 105
Orientation 107
Janitor 103
Storage 125
15
16
18
12
13
11
10
21
19
9
8
5
7
24
23
22
2
6
1

EXHIBIT 4